Name: Date:

Polynomial Factoring solution (version 6)

1. **The quadratic formula says if $ax^2 + bx + c = 0$ then $x = \frac{-b \pm \sqrt{b^2 - 4ac}}{2a}$. Use the quadratic formula to solve the following equation.**

$$x^2 + 4x + 17 = 0$$

Simplify your answer(s) as much as possible.

Solution

$$x = \frac{-(4) \pm \sqrt{(4)^2 - 4(1)(17)}}{2(1)}$$

$$x = \frac{-(4) \pm \sqrt{16 - 68}}{2(1)}$$

$$x = \frac{-4 \pm \sqrt{-52}}{2}$$

$$x = \frac{-4 \pm \sqrt{-4 \cdot 13}}{2}$$

$$x = \frac{-4 \pm 2\sqrt{13}\, i}{2}$$

$$x = -2 \pm \sqrt{13}\, i$$

Notice that i in NOT under the square-root radical symbol!!

2. **Express the product of $5 + 9i$ and $4 + 2i$ in standard form $(a + bi)$.**

Solution

$$(5 + 9i) \cdot (4 + 2i)$$

$$20 + 10i + 36i + 18i^2$$

$$20 + 10i + 36i - 18$$

$$20 - 18 + 10i + 36i$$

$$2 + 46i$$

Polynomial Factoring solution (version 6)

3. **Write function $f(x) = x^3 + x^2 - 22x - 40$ in factored form. I'll give you a hint: one factor is $(x - 5)$.**

Solution

	1	1	-22	-40
5		5	30	40
	1	6	8	0

$$f(x) = (x-5)(x^2+6x+8)$$

$$f(x) = (x-5)(x+4)(x+2)$$

4. **Polynomial p is defined below in factored form.**

$$p(x) = (x+7)^2 \cdot (x+4) \cdot (x+1) \cdot (x-4)$$

Sketch a graph of polynomial $y = p(x)$.